

National Phase of PCT/EP03/04242, filed April 22, 2003
Claims amended October 15, 2004

Amendments to the Claims:

1-20 (Cancelled)

21. (New) A polyurethane resin being the reaction product of at least one diisocyanate and a group of components having isocyanate reactive functional groups, said group of components comprising:

- a) a first group of one or more polyether polyols each having an average molecular weight in the range of between 400 to 12000 g/mol,
- b) a second group of one or more polyhydroxylated resins selected from the group consisting of hard ketonic resins, ketonic resins, unsaturated styrene-free polyester resins having a hydroxyl number below 100 g KOH/g, acrylic-styrene copolymers, acrylic polyols, rosin derivatives and terpene-phenolic resins,
- c) optionally a third group of one or more polyols each having an average molecular weight of equal or less than 800 g/mol and which are selected from the group consisting of monomeric diols, dihydroxy polyether polyols, polyester polyols, and
- d) at least one amine and a reaction terminating agent,

wherein the ratio of the equivalent weights of the diisocyanate to the components having isocyanate reactive functional groups is selected such that essentially all of the isocyanate groups of the diisocyanate are present as the reaction product with one of said isocyanate reactive functional groups.

22. (New) A polyurethane resin according to claim 21, wherein the ratio of the equivalent weights of the diisocyanate to the entirety of the polyether polyols of the first group, of the polyhydroxylated resins of the second group and of the polyols of the third group is in a range of 3.6:1 to 1:1.

23. (New) A polyurethane resin according to claim 21 or 22, wherein the ratio of the equivalent weights of the diisocyanate to the components having isocyanate reactive functional groups is preferably in a range of between 0.8:1 to 1.2:1.
24. (New) A polyurethane resin according to claim 21, wherein the ratio of the equivalent weights of the diisocyanate to the amines is in a range of 2:1 to 6:1.
25. (New) A polyurethane resin according to claim 21, wherein the polyether polyols of the first group have an average molecular weight in the range of from 2000 to 6000g/mol.
26. (New) A polyurethane resin according to claim 25, wherein the polyether polyols of the first group are selected from the group consisting of dihydroxy and trihydroxy polyether polyols.
27. (New) A polyurethane resin according to claim 26, wherein the dihydroxy polyether polyol is selected from the group consisting of polyoxyalkylene glycol and a caprolactone based polyether.
28. (New) A polyurethane resin according to claim 21, wherein the ketonic resins are polyketonic resins, cyclohexanone condensation products, or condensation products of an aliphatic ketone with formaldehyde.
29. (New) A polyurethane resin according to claim 21, wherein the acrylic-styrene copolymers are hydroxy-functional copolymers.
30. (New) A polyurethane resin according to claim 21, wherein the acrylic polyols

are resinous polyols having a hydroxyl number between 100 and 200 KOH/g.

31. (New) A polyurethane resin according to claim 21, wherein the terpene-phenolic resins have a hydroxyl number between 100 and 200 KOH/g.

32. (New) A polyurethane resin according to claim 21, wherein the amine is a diamine.

33. (New) Process for preparing a polyurethane resin according to claim 21, said process comprising the steps of:

- a) first reacting a mixture comprising: a first group of one or more polyether polyols each having an average molecular weight in the range of between 400 to 12000 g/mol, a second group of one or more polyhydroxylated resins selected from the group consisting of hard ketonic resins, ketonic resins, unsaturated styrene-free polyester resins having a hydroxyl number below 100 g KOH/g, acrylic-styrene copolymers, acrylic polyols, rosin derivatives and terpene-phenolic resins, and optionally a third group of one or more polyols each having an average molecular weight of equal or less than 800 g/mol and which are selected from the group consisting of monomeric diols, dihydroxy polyether polyols, polyester polyols, with at least one diisocyanate to an isocyanate terminated prepolymer, the ratio of the equivalent weights of the diisocyanate to the entirety of the polyether polyols of the first group, of the polyhydroxylated resins of the second group and of the polyols of the third group is in a range of 3.6:1 to 1:1, and
- b) in a second step reacting said isocyanate terminated prepolymer with at least one diamine, and
- c) in a third step reacting the product obtained according to step b) with a terminating agent to a saturated polyurethane resin.

34. (New) Polyurethane resin, obtainable by the process according to claim 33.

35. (New) A coating composition, comprising a solvent and at least one polyurethane resin according to claim 21 or 34 as film forming binder.

36. (New) Method of producing a laminate carrying a printed layer, said method comprises the steps of

- a) providing a coating composition according to claim 35;
- b) applying a layer to a first substrate by printing said printing ink of step a) in a flexographic and/or gravure printing process;
- c) removing said solvent from said layer thereby drying and/or curing said layer obtained in step b),
- d) applying an adhesive to the dried and/or cured layer obtained in step c) and producing the laminate by applying at least a second substrate on the adhesive.

37. (New) Laminate, produced by the method of claim 36.